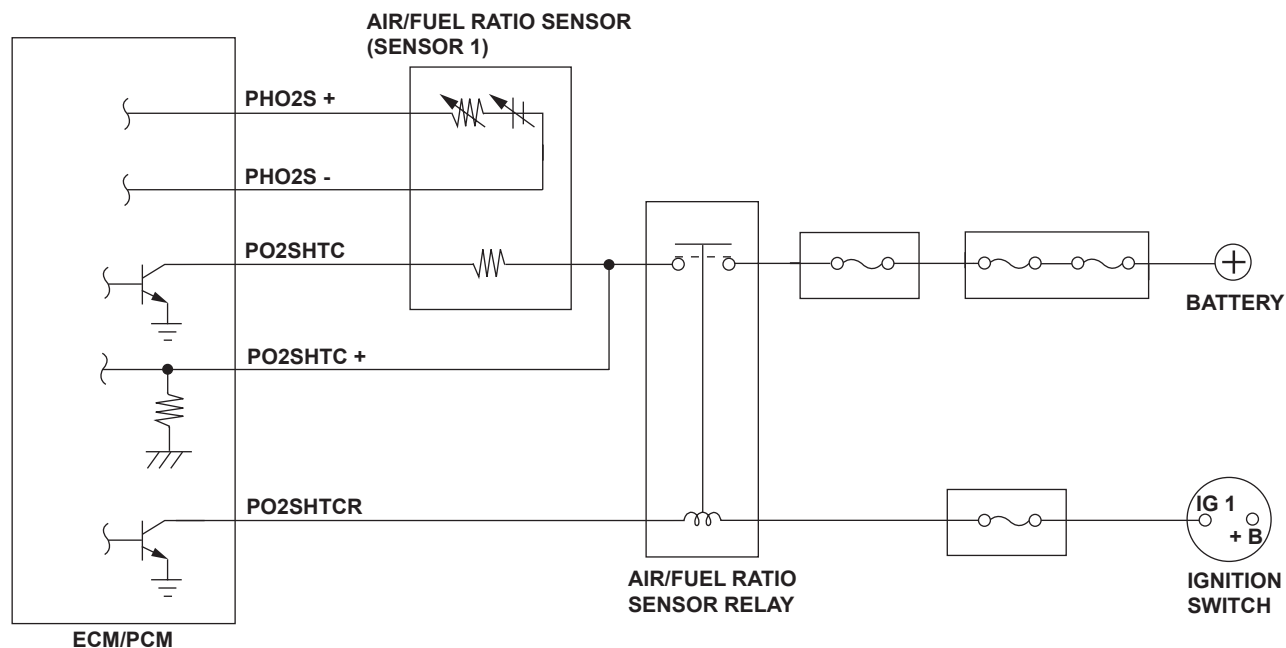


Advanced Diagnostics

DTC P1166: Air/Fuel Ratio (A/F) Sensor (Sensor 1) Heater System Electrical Problem



P1162-9801

General Description

A heater for the sensor element is embedded in the air/fuel ratio (A/F) sensor (sensor 1) and is controlled by the engine control module (ECM)/powertrain control module (PCM). It is activated and heats the sensor to stabilize and speed the detection of oxygen content when the exhaust gas temperature is cold. If a combination of A/F sensor (sensor 1) heater voltage and current is not a set value or overheated heater is detected, a malfunction is detected and a DTC is stored.

Monitor Execution, Sequence, Duration, DTC Type

Execution	Under the Enable Condition
Sequence	None
Duration	—
DTC Type	One drive cycle, MIL ON

Enable Conditions

Condition		Minimum	Maximum
Engine coolant temperature	For 25 seconds after turning the ignition on	14°F (-10°C)	—
	Engine run	-4°F (-20°C)	
Battery voltage (IGP terminal of ECM/PCM)		9.7 V	16.0 V
State of the engine		Running	
No active DTCs		A/F Sensor (sensor 1) Heater	
Other		A/F Sensor (sensor 1) Heater is activated	

Malfunction Threshold

One of following conditions must be met.

- The heater voltage is 5 V or less and current is more than 1.5 A for at least 3.9 seconds while the heater is activated, and the heater voltage is 5 V or less and current is 1.5 A or less for at least 3.9 seconds while the heater is not activated.
- The heater voltage is 5 V or less and current is 1.5 A or less for at least 3.9 seconds while the heater is activated, and the heater voltage is 5 V or less and current is 1.5 A or less for at least 3.9 seconds while the heater is not activated.
- The heater voltage is 5 V or more and current is more than 1.5 A for at least 3.9 seconds while the heater is activated, and the heater voltage is 5 V or more and current is 1.5 A or more for at least 3.9 seconds while the heater is not activated.
- The heater voltage is 5 V or more and current is 1.5 A or less for at least 3.9 seconds while the heater is activated, and the heater voltage is 5 V or more and current is 1.5 A or less for at least 3.9 seconds while the heater is not activated.
- The heater current is 23 A or more for at least 0.4 second.

Driving Pattern

Start the engine. Hold the engine at 3,000 rpm with no load (in park or neutral) until the radiator fan comes on.

Diagnosis Details

Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.